

CLAIMS

1. A surface acoustic wave device comprising:
 - a piezoelectric substrate;
 - 5 a comb-shaped electrode formed on a first principal face of the piezoelectric substrate; and
 - a supporting substrate bonded to a second principal face of the piezoelectric substrate,
 - wherein the second principal face of the piezoelectric substrate is
 - 10 bonded to the supporting substrate via a metal layer.
2. The surface acoustic wave device of claim 1, wherein the supporting substrate includes a through-hole and an electric conductor provided inside the through-hole, and the electric conductor is electrically coupled to the metal
- 15 layer.
3. The surface acoustic wave device of claim 1, wherein the metal layer is removed the metal in part.
- 20 4. The surface acoustic wave device of claim 1, wherein the piezoelectric substrate employs rotated Y-cut lithium tantalate.
5. The surface acoustic wave device of claim 1, the supporting substrate employs a substrate made of sapphire.
- 25 6. The surface acoustic wave device of claim 1, wherein the metal layer employs gold.

7. A method of manufacturing a surface acoustic wave device, the method comprising the steps of:

forming a first metal layer on a second principal face of a
5 piezoelectric substrate having a first principal face and the second principal face;

forming a second metal layer on a principal face of a supporting substrate;

activating surfaces of the first and the second metal layers in
10 plasma atmosphere;

bonding the first metal layer and the second metal layers together at room temperature; and

forming a comb-shaped electrode on the first principal face of the piezoelectric substrate.
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8. The method of claim 7, wherein the first and the second metal layers are made of identical metal.

9. The method of claim 7 further comprising the steps of:
20 forming the first metal layer, of which metal is removed in part by lift-off, on the second principal face of the piezoelectric substrate;

forming the second metal layer entirely on the principal face of the supporting substrate; and

bonding the first metal layer and the second metal layer
25 together at room temperature.

10. The method of claim 7 further comprising the steps of:

removing the metal in part from the first metal layer by etching after forming the first metal layer entirely on the second principal face of the piezoelectric substrate;

forming the second metal layer entirely on the principal face of
5 the supporting substrate; and

bonding the first metal layer and the second metal layer together at room temperature.

11. The method of claim 7 further comprising the steps of:

10 bonding the first metal layer and the second metal layer together at room temperature;

providing the supporting substrate with a through-hole; and

forming an electric conductor covering at least an inner wall of the through-hole by at least one of sputtering and plating, and electrically
15 coupling the electrical conductor covering the inner wall of the through-hole to the second metal layer.